Transistors

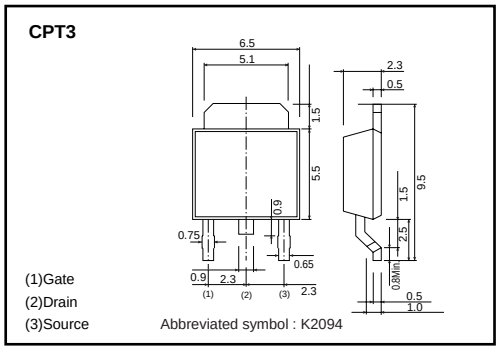
4V Drive Nch MOS FET

2SK2094

●Structure
Silicon N-channel MOS FET

●External dimensions (Unit : mm)

CPT3



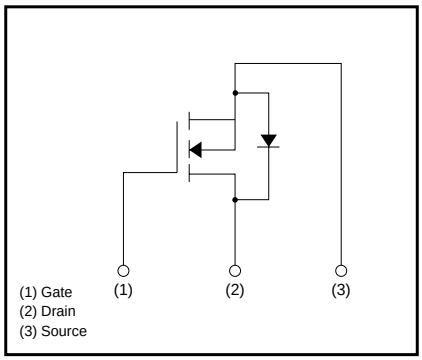
●Features
1) Low On-resistance.
2) Fast switching speed.
3) Wide SOA (safe operating area).
4) 4V drive.
5) Drive circuits can be simple.
6) Parallel use is easy.

●Applications
Switching

●Packaging specifications

Type	Package	Taping
	Code	TL
	Basic ordering unit (pieces)	2500
2SK2094		○

●Inner circuit



●Absolute maximum ratings (Ta=25°C)

Parameter		Symbol	Limits	Unit
Drain-source voltage		V_{DSS}	60	V
Gate-source voltage		V_{GSS}	±20	V
Drain current	Continuous	I_D	2	A
	Pulsed	I_{DP}*	8	A
Reverse drain current	Continuous	I_{DR}	2	A
	Pulsed	I_{DRP}*	8	A
Total power dissipation(Tc=25°C)		P_D	10	W
Channel temperature		Tch	150	°C
Storage temperature		Tstg	−55 to +150	°C

* Pw ≤ 300μs, Duty cycle ≤ 2%

●**Electrical characteristics** (Ta=25°C)

Parameter	Symbol	Min.	Typ.	Max.	Unit	Test Conditions
Gate-source leakage	I_{GSS}	–	–	±100	nA	V_{GS}= ±20V, V_{DS}=0V
Drain-source breakdown voltage	$V_{(BR)DSS}$	60	–	–	V	I_D=1mA, V_{GS}=0V
Zero gate voltage drain current	I_{DSS}	–	–	100	μA	V_{DS}=60V, V_{GS}=0V
Gate threshold voltage	$V_{GS(th)}$	1.0	–	2.5	V	V_{DS}=10V, I_D=1mA
Static drain-source on-state resistance	$R_{DS(on)}$	–	0.3	0.35	Ω	I_D=1A, V_{GS}=10V
		–	0.4	0.5		I_D=1A, V_{GS}=4V
Forward transfer admittance	$\|Y_{fs}\|$	1.0	–	–	S	V_{DS}=10V, I_D=1A
Input capacitance	C_{iss}	–	400	–	pF	V_{DS}=10V
Output capacitance	C_{oss}	–	150	–	pF	V_{GS}=0V
Reverse transfer capacitance	C_{rss}	–	50	–	pF	f=1MHz
Turn-on delay time	$t_{d(on)}$	–	10	–	ns	I_D=1A, V_{DD}≒30V
Rise time	t_r	–	20	–	ns	V_{GS}=10V
Turn-off delay time	$t_{d(off)}$	–	100	–	ns	R_L=30Ω
Fall time	t_f	–	40	–	ns	R_G=10Ω
Reverse recovery time (Body Diode)	t_{rr}	–	100	–	ns	I_{DR}=2A, V_{GS}=0V, di/dt=50A/μs

●**Electrical characteristics curve**

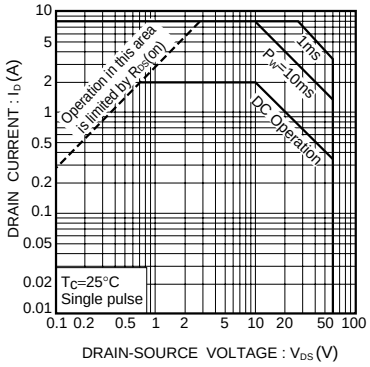


Fig.1 Maximum Safe Operating Area

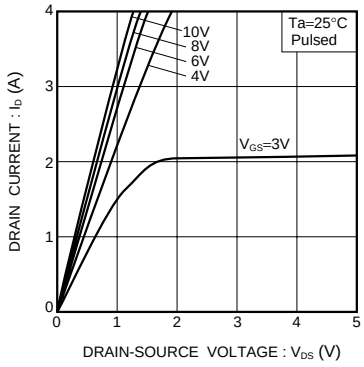


Fig.2 Typical Output Characteristics

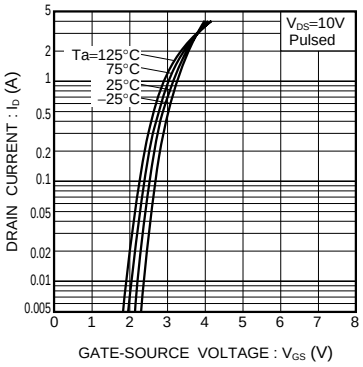


Fig.3 Typical Transfer Characteristics

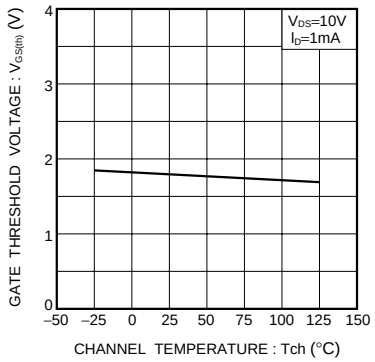


Fig.4 Gate Threshold Voltage vs. Channel Temperature

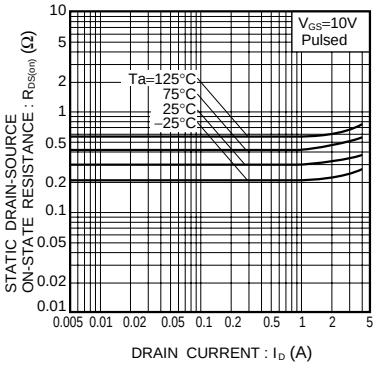


Fig.5 Static Drain-Source On-State Resistance vs. Drain Current (I)

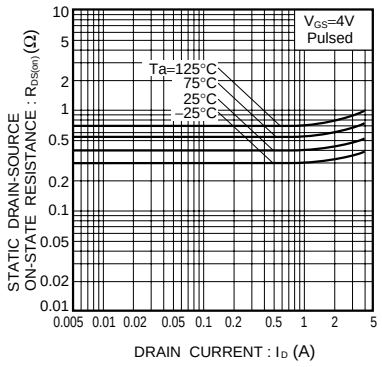


Fig.6 Static Drain-Source On-State Resistance vs. Drain Current (II)

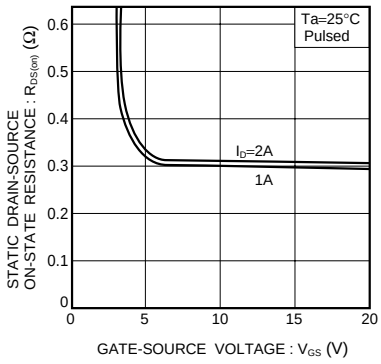


Fig.7 Static Drain-Source On-State Resistance vs. Gate-Source Voltage

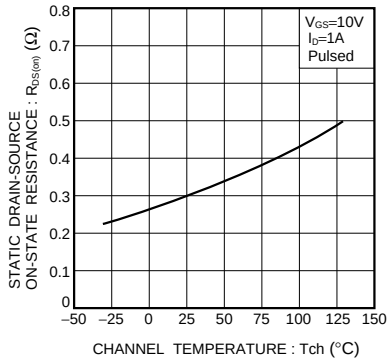


Fig.8 Static Drain-Source On-State Resistance vs. Channel Temperature

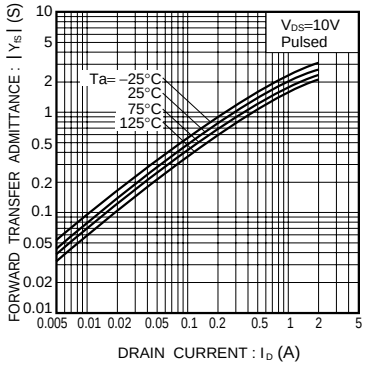


Fig.9 Forward Transfer Admittance vs. Drain Current

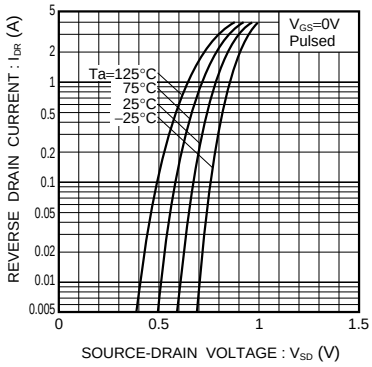


Fig.10 Reverse Drain Current vs. Source-Drain Voltage (I)

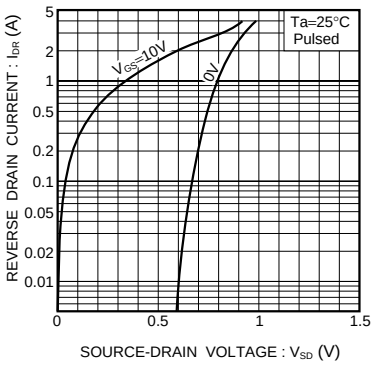


Fig.11 Reverse Drain Current vs. Source-Drain Voltage (II)

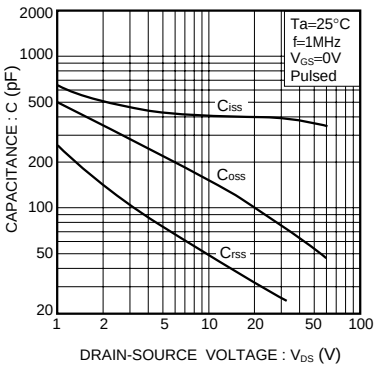


Fig.12 Typical Capacitance vs. Drain-Source Voltage

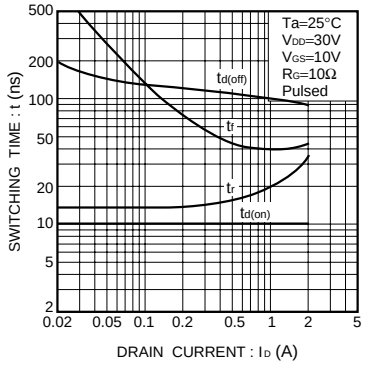


Fig.13 Switching characteristics (See Figure. 15 and 16 for the measurement circuit and resultant waveforms)

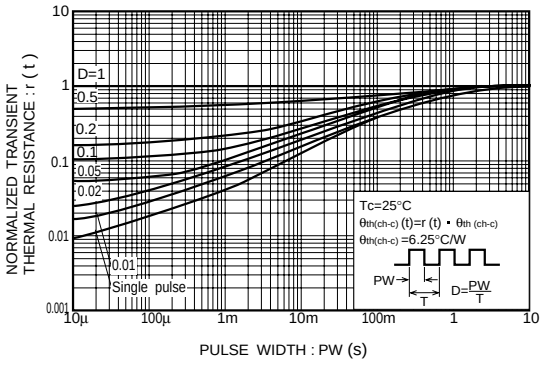


Fig.14 Normalized Transient Thermal Resistance vs . Pulse Width

●Switching characteristics measurement circuit

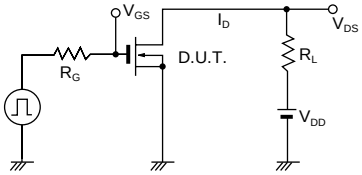


Fig.15 Switching Time Test Circuit

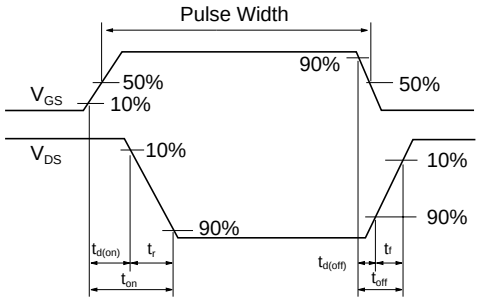


Fig.16 Switching Time Waveforms

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